



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/634,341	08/05/2003	Kenichi Nara	4041J-000751	6753

27572 7590 02/07/2006

HARNESS, DICKEY & PIERCE, P.L.C.
P.O. BOX 828
BLOOMFIELD HILLS, MI 48303

EXAMINER

MCKINNON, TERRELL L

ART UNIT	PAPER NUMBER
----------	--------------

3753

DATE MAILED: 02/07/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/634,341

Applicant(s)

NARA ET AL.

Examiner

Terrell L. Mckinnon

Art Unit

3753

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 October 2005.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 43-53 and 70-87 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) 43-53 and 70-87 is/are allowed.
- 6) ☒ Claim(s) _____ is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 8/5/2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 7/18/05

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

Response to Amendment

Receipt is acknowledged of applicant's amendment filed October 25, 2005. Claims 54-69 have been canceled without prejudice. Claims 43-53 and 70-87 are pending and an action on the merits is as follows.

Applicant's arguments with respect to claims 43-53 and 70-87 have been considered but are moot in view of the new grounds of rejection.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 43-53 and 70-87 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hamilton et al. (U.S. 5,841,244) in view of Nelson et al. (U.S. 4,884,630).

Hamilton discloses a cooling unit comprising:

- a plurality of flow paths for a fluid to flow therethrough for transporting heat generated by a heat source from a hot region to a cold region;
- a microchannel (44) is formed in a part of the flow paths in a vicinity of the heat source;
- a tube-shaped aluminum member defining a plurality of

through-holes formed parallel to each other, the through-holes constituting at least part of the flow;

- the microchannel is formed of a metal defining a cavity which is in communication from one end to the other end in a flow direction of the fluid, the metal being disposed in the flow paths in the vicinity of the heat source;
- a flow of the fluid is an oscillating flow with a predetermined cycle and predetermined amplitude (Figs. 3);
- the microchannel is provided in an area corresponding to the mounting area among the flow paths; and
- the fluid flows in the paths continuously.

Hamilton's invention discloses all of the claimed limitations from above except for the microchannel flow paths in the heat receiver being smaller in size in size relative to other portions; and the flow paths are compressed in the vicinity of the heat source.

However, Nelson teaches a microchannel formed in a vicinity of a heat source, wherein the flow paths are smaller in size relative to other portions (Figs. 3 and 4); and the flow paths are compressed in the vicinity of the heat source.

Given the teachings of Nelson, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the cooling unit of Hamilton with a microchannel formed in the flow paths in a vicinity of a heat source, the flow paths being smaller in size relative to other portions; the microchannel is formed of any one of at least one tubular member and at least one rod-like member disposed in the flow paths

Art Unit: 3753

in the vicinity of the heat source; the microchannel is formed of a metal defining a cavity which is in communication from one end to the other end in a flow direction of the fluid, the metal being disposed in the flow paths in the vicinity of the heat source.

Doing so would provide enhance heat transfer and improve the efficiency of the heat transport system.

3. Claims 51 and 82 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hamilton et al. (U.S. 5,841,244) in view of Nelson et al. (U.S. 4,884,630) as applied to claims above, and further in view Willemsen et al. (U.S. 5,205,353).

Hamilton's invention, as modified by Nelson, discloses all of the claimed limitations from above except for the metal defining the cavity comprise a metal selected from the group consisting of a foamed metal, a sintered metal, and a thermal sprayed metal.

However, Willemsen teaches the use of a metal defining the cavity comprises a metal selected from the group consisting of a foamed metal, a sintered metal, and a thermal sprayed metal (column 2, lines 49-52).

Given the teachings of Willemsen, it would have been obvious to one of ordinary skill in the art at the time of the invention to further modify the cooling unit of Hamilton with the metal defining the cavity comprises a metal selected from the group consisting of a foamed metal, a sintered metal, and a thermal sprayed metal.

Doing so would provide alternate materials that are highly conductive which will enhance heat dissipation of the cooling unit.

Response to Arguments

Applicant's arguments filed October 25, 2005 have been fully considered but they are not persuasive.

Applicant's states, " Claim 43, as amended, patentably distinguishes over the art of record. Likewise, Claims 44-53, which ultimately depend from Claim 43, are also believed to patentably distinguish over the art of record. Reconsideration of the rejection is respectfully requested ".

Hamilton et al. (U.S. 5,841,244) in view of Nelson et al. (U.S. 4,884,630) and further in view Willemssen et al. (U.S. 5,205,353) discloses the applicant's claimed and disclosed limitation as stated above.

Conclusion

1. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of


Art Unit: 3753

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Terrell L. Mckinnon whose telephone number is 571-272-4797. The examiner can normally be reached on Monday -Thursday and every other Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Blau can be reached on 571-272-4406. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Terrell L Mckinnon
Primary Examiner
Art Unit 3753
January 23, 2006